2002
Annual Consumer Report on the Quality of Tap Water
National Training Center, Fort Irwin, California

*****Este informe contiene informacion muy importante sobre su agua beber. Traduzcalo o hable con alguien que lo entienda bien.**

Introduction

This is an annual report on the quality of water delivered by the National Training Center, Fort Irwin, California (NTC). Under the "Consumer Confidence Reporting Rule" of the federal Safe Drinking Water Act (SDWA), community water systems are required to report this water quality information to the consuming public. Presented in this report is information on the source of our water, its constituents and the health risks associated with any contaminants.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include: (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. (B) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses. (D) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can, also come from gas stations, urban storm water runoff, and septic systems. (E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

EPA and state drinking water health standards limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791) or find it on EPA's web site at www.epa.gov/safewater/hfacts.html.

We continually monitor the drinking water for contaminants. However, some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 800-426-4791.

The type of water found at the NTC is groundwater, meaning it comes from underground aquifers from one of or a combination of three sources: 1). Bicycle Lake Basin, located approximately 2 miles northeast of the cantonment area adjacent to Barstow Road; 2). Langford Lake Basin, located approximately 2 miles southeast of the cantonment area adjacent to Langford Lake Road; and 3). Irwin Basin, located within the cantonment area itself.

Monitoring of Your Drinking Water

Clinical Laboratories of San Bernardino has been subcontracted by Johnson Controls World Services, Inc to provide chemical, physical and bacterial analysis of the drinking water, domestic water and source water at the NTC. The requirements were issued to comply with Federal and State regulations for potable and drinking water according to the Safe Drinking Water Act and Clean Water Act.

At NTC, we monitor for the contaminant groups listed in Column 1 of the following table using EPA-approved methods. Column 2 of the table specifies the monitoring frequency for these contaminant groups.

Analyte Groups and Monitoring Frequency Table

Analyte/Contaminant Group	Monitoring Frequency
Bacteriological	
RO system	3 per week
Domestic	3 per week
General Physical	
RO system	1 per month
Domestic	1 per month
Trihalomethanes	
Domestic	4 per quarter
Fluoride	
RO system	1 per pressure zone/week
Domestic	1 per week
TDS	
RO system	1 per pressure zone/week
Domestic	1 per week
Corrosivity	
RO system	1 per pressure zone/week
Lead	
RO system	1 per pressure zone/week
Temperature	
RO system	1 per pressure zone/week

Source Water Assessment

A source water assessment was completed in 1997 in the form of a document entitled "Ground-Water Hydrology and Water Quality of Irwin Basin at Fort Irwin National Training Center, California," Water-Resources Investigations Report 97-4092 published by the U.S. Geological Survey. Copies of this report can be purchased from: U.S. Geological Survey Information Services, Box 25286, Federal Center, Denver, CO 80225. Source water assessments for Langford and Bike Lake Basins are not available. The following water quality summary is printed from the report:

"Ground-water quality at Fort Irwin (Bicycle Lake Basin, Langford Lake Basin and Irwin Basin) varies areally in the water-bearing deposits. Water in most of Irwin Basin is sodium based with sulfate, chloride, and bicarbonate as the primary anions. Calcium and sodium are the primary cations from wells in the southeast part of the basin near the wastewater-treatment facility. Dissolved-solids and nitrate concentrations are used to describe the areal variation in water quality.

The dissolved-solids concentrations of water throughout Irwin Basin range from 433 to 6,380 mg/L and that of native ground water ranges from 540 to 645 mg/L. In general, dissolved-solids concentrations are higher in the

upper aquifer, than they are in the lower aquifer because the upper aquifer is more easily contaminated from surface infiltration. High dissolved-solids concentrations are in the southeastern part of Irwin Basin near the wastewater-treatment facility, golf course, and sprinkler-pivot field (no longer operational). The highest dissolved-solids concentrations (2,140 - 6,380 mg/L) are in porewater from four lysimeters and a water table well beneath the sprinkler-pivot field. The fact that the dissolved-solids concentrations of the porewater increase with depth in the unsaturated zone beneath the sprinkler-pivot field suggests that the wastewater effluent leaches salts from the unsaturated zone. This area is the lowest part of the basin, and evaporite deposits are in the surface deposits as a result of evaporation from surface water collecting in this area. When water is added, the evaporite deposits are leached and migrate downward to the water table.

The ground water of high dissolved-solids concentration is migrating northwestward toward the pumping depression. Westward horizontal migration of the water is retarded at depth by the Garlic Spring Fault, which acts as a partial barrier to ground water flow near the wastewater-treatment facility. Water from wells east of Garlic Spring Fault contains moderate to high dissolved-solids concentrations (863 - 1,523 mg/L) throughout the saturated thickness, whereas water from wells west of the fault contains high dissolved-solids concentrations (greater than 700 mg/L) in the upper aquifer and low dissolved-solids concentrations (less than 700 mg/L) in the lower aquifer. Downward vertical movement of high dissolved-solids concentration water seems to be impeded by the fine-grained deposits in the older alluvium in the southeastern part of the basin near the wastewater-treatment facility.

Nitrate-N concentrations in excess of 5 mg/L are in ground water in three areas of Irwin Basin: (1) near the wastewater-treatment facility, (2) near the northern end of and beneath the sanitary-landfill facility, and (3) in the west central part of the basin. Nitrate-N concentrations in excess of 10 mg/L, the maximum contaminant level of nitrate as nitrogen, are in water beneath and adjacent to the wastewater-treatment facility in a plume that extends about 0.5 mi northwest of the treatment facility and about 0.25 mi southeast of the duck ponds. No known horizontal barriers exist between the nitrate plume and the base productions wells. The time required for the nitrate plume to reach the nearest production well was estimated at about 43 years by a Darcy's law calculation. Actual movement may take place faster or slower than calculated.

High nitrate concentrations are in water from wells north of and beneath the sanitary-landfill facility. High nitrate concentrations are a likely result of wastewater recharging the aquifer beneath the wastewater-treatment facility. High nitrate and dissolved-solids concentrations also are near the center of the base in Irwin Basin. Possible sources of the nitrate are wastewater leakage, fertilizer used on lawns and playing fields, and natural soil nitrate. Nitrogen isotopic data are being analyzed to help determine the source of the high nitrate concentrations.

Changes in dissolved-solids and nitrate concentrations have been observed since water-quality data collection began with the construction of the first production well in 1941. Dissolved-solids and nitrate-N concentrations in water from production wells that are west of an unnamed fault in Irwin Basin have increased since 1941. Irrigation-return flows and mobilized natural nitrate from the base housing area and the soccer and Army ball fields may be the source of the increased concentrations. With the exception of two wells, dissolved-solids and nitrate-N concentrations in water from production wells that are east of the unnamed fault have remained relatively stable. Although the unnamed fault may retard lateral movement of the degraded water, continued monitoring is needed to determine this."

Definitions of Key Terms

To gain a better understanding of the content of this report, several key terms must be defined. They are as follows:

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below, which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Public Health Goal (PHG): The level of a contaminant in drinking water below, which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency

Maximum residual disinfectant level (MRDL): The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

Maximum residual disinfectant level goal (MRDLG): The level of a disinfectant added for water treatment below, which there is no known or expected risk to health. MRDLs are set the U.S. Environmental Protection Agency.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Regulatory Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.

Additional Acronyms/Terms Used In This Report

Below is a listing of acronyms and terms (with explanations) used in this Consumer Confidence Report.

ppm-parts per million; a unit of measure equivalent to a single penny in $10,000
ppb-parts per billion; a unit of measure equivalent to a single penny in $10,000,000
pptp-arts per trillion; a unit of measure equivalent to a single penny in $10,000,000,000
ppq-parts per quadrillion; a unit of measure equivalent to a single penny in $10,000,000,000,000
mg/kg-milligrams per kilogram; a unit of measure equivalent to part per million (ppm)
*u*g/L-micrograms per liter; a unit of measure equivalent to part per billion (ppb)
mrem/yr -millirem per year; a measure of radioactivity in water
MFL-million fibers per liter; a measure of asbestos in water
CCR-Consumer Confidence Report
SDWA-Safe Drinking Water Act; Federal law which sets froth drinking water regulations
pCi/L-picocuries per liter; a measure of radioactivity in water
NTU-nephelometric turbidity unit; a measure of turbidity in water
TTHM-total trihalomethanes; byproducts of drinking water disinfection
Level Found-laboratory analytical result for a contaminant; this value is evaluated against an MCL or AL -to determine compliance.
Range-the range of the highest and lowest analytical values of a reported contaminant. For example, the range of reported analytical detections of an unregulated contaminant may be 10.1 ppm (lowest value) to 134.4 ppm (highest value). EPA requires this range to be reported.

Results Table. Detected Contaminants

The following table presents the results of our monitoring for the reporting period of 2002. In reading the tables, compare the MCL column to the Level Found column. As you can see, the only contaminant, which exceeds the maximum level, is the Fluoride in the Domestic Water system. Once Reverse Osmosis treats the water, all contaminants are within acceptable ranges.

Results Table - Detected Contaminants
Domestic Water

Contaminant	MCLG	MCL*/ MRDL	Level Found	Range	Exceeded Standard?	Likely Source of Contaminant
Fluoride	2.0 mg/L	2.0 mg/L	4.5 mg/L	4.6 – 1.6	Yes	Naturally occurring
Temperature	NA	NA	62.2 F	80 - 62	No	Seasonal variations
TDS	NA	NA	550 mg/L	NA	No	NA
Total Hardness (as CaCO3)	NA	NA	110 mg/L	NA	No	NA
Calcium (Ca)	NA	NA	32 mg/L	NA	No	NA
Chloride (Cl)	NA	NA	90 mg/L	NA	No	NA
Magnesium (Mg)	NA	NA	7.2 mg/L	NA	No	NA
Nitrate (NO3)	45 mg/L	45 mg/L	12 mg/L	NA	No	NA
Odor Threshold at 60^{o} C	NA	NA	1	NA	No	NA
Sodium (Na)	NA	NA	150 mg/L	NA	No	NA
Total Alkalinity (as CaCO3)	NA	NA	190 mg/L	NA	No	NA
Lab Turbidity	1 NTU	1 NTU	0.1 NTU	NA	No	NA
Potassium (K)	NA	NA	9 mg/L	NA	No	NA
Sulfate (SO4)	NA	NA	130 mg/L	NA	No	NA
Bicarbonate (HCO3)	NA	NA	230 mg/L	NA	No	NA
Nitrate + Nitrite (as N)	10 mg/L	10 mg/L	2.7 mg/L	NA	No	NA
pH (Laboratory)	NA	NA	7.7	NA	No	NA
Arsenic (As)	.05 mg/L	.05 mg/L	0.008 mg/L	NA	No	NA

***State of California MCL value**
ND = Not Detected at or above the DLR; Detection Limit for Reporting

Results Table - Detected Contaminants
Reverse Osmosis Drinking Water

Contaminant	MCLG	MCL*/ MRDL	Level Found	Range	Exceeded Standard?	Likely Source of Contaminant
Fluoride (F)	2.0 mg/L	2.0 mg/L	0.27 mg/L	1.4 - 0.0	No	NA
Temperature	NA	NA	71.6 F	80 - 62	No	Seasonal variations
TDS	NA	NA	110 mg/L	NA	No	NA
Total Hardness (as CaCO3)	NA	NA	36 mg/L	NA	No	NA
Calcium (Ca)	NA	NA	7.5 mg/L	NA	No	NA
Chloride (Cl)	NA	NA	26 mg/L	NA	No	NA
Magnesium (Mg)	NA	NA	2.0 mg/L	NA	No	NA
Nitrate (NO3)	45 mg/L	45 mg/L	3.7 mg/L	NA	No	NA
Odor Threshold at 60^{o} C	NA	NA	1	NA	No	NA

Sodium (Na)	NA	NA	30 mg/L	NA	No	NA
Total Alkalinity (as CaCO3)	NA	NA	34.0 mg/L	NA	No	NA
Lab Turbidity	1 NTU	1 NTU	0.1 NTU	NA	No	NA
Potassium (K)	NA	NA	2.0 mg/L	NA	No	NA
Sulfate (SO4)	NA	NA	21 mg/L	NA	No	NA
Bicarbonate (HCO3)	NA	NA	42 mg/L	NA	No	NA
Nitrate + Nitrite (as N)	10 mg/L	10 mg/L	0.008mg/L	NA	No	NA
pH (Laboratory)	NA	NA	7.2	6.4-7.8	No	NA
Arsenic	.05 mg/L	.05 mg/L	.0026 mg/L	NA	No	Naturally occurring

*** State of California MCL value**

** < 40 samples obtained per month, no more than 1 positive Total Coliform result allowed

***All positive Total Coliform results require a Fecal Coliform test

ND = Not Detected at or above the DLR; Detection Limit for Reporting

A source water assessment was conducted for the Langford Well Nos. 1,2 & 3; Irwin Basin Well Nos. 3, 5 & 7; and Bicycle Lake Basin Well Nos. B1, B4, B5 & B6 of the U.S. Army Fort Irwin National Training Center water system in January 2003 and is summarized in the table below.

Source Number	Source ID	Most Vulnerable Activities (PCA)	Chemical Detected
001	Langford Well No. 1	Military installations	None
002	Langford Well No. 2	Military Installations	None
003	Langford Well No. 3	Military Installations	None
005	Irwin Basin Well No. 3	Chemical/petroleum processing/storage Military Installations	None None
007	Irwin Basin Well No. 5	Military installations ---------- Parks	None --------- Arsenic Nitrate
009	Irwin Basin Well No. 7	Military Installations	None
010	Bicycle Lake Basin Well No. B1	Military Installations	None
012	Bicycle Lake Basin Well No. B4	Military Installations	None
013	Bicycle Lake Basin Well No. B5	Military Installations	None
015	Bicycle Lake Basin Well No. B6	Military Installations	None

A copy of the completed assessment may be viewed U.S. Army Fort Irwin Directorate of Public Works office or a DHS San Bernardino District Office, 464 West 4th Street, Suite 437, San Bernardino, CA 92401.

You may request a summary of the assessment be sent to you by contacting the DHS San Bernardino District Office at (909) 383-4328.

Detected Contaminants

We constantly monitor for various contaminants in the water supply to meet all regulatory requirements. Many other contaminants have been analyzed also, but were not present or were below the detection limits of the lab equipment.

Fluoride
Some people who drink water-containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth. Fort Irwin maintains the dual water system to alleviate the problems posed by fluoride. The Reverse Osmosis water provided for drinking water contains between 0.6 and 0.8 ppm fluoride, which is the level recommended for protection from tooth decay.

Arsenic
Fort Irwin domestic water has arsenic levels of 8-17 parts per billion. The current MCL for arsenic is 50 ppb. Fort Irwin water is in compliance with current regulations. However, since our arsenic levels fall between 50 ppb and 5ppb, we are required by EPA to include the following warning:
"Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer."

Total Coliform
Since we collect fewer than 40 total coliform samples per month, EPA requires us to report the highest monthly number of positive samples. The Domestic water had a total of 0 positive samples for this reporting cycle.

Public Involvement

The point of contact for questions regarding this CCR is the Public Affairs Officer, Major Michael Lawhorn at (760) 380-3078. Opportunities for public participation in decisions that affect the quality of the water produced at the NTC may be discussed at the regularly scheduled Town Hall meetings. Town Hall meeting schedules are published in the Tiefort Telegraph in the Community Calendar. Schedules are also published in the Community Services Council Meeting minutes.

Directorate of Public Works, Environmental Division, prepared this Consumer Confidence Report. Point of contact is Mr. Muhammad Bari at (760) 380-3410.